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Does Judge Turnover Affect Judicial Performance? Evidence from Italian Court Records

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Abstract

Italy is among the countries with the highest litigation rate and those with the highest duration of trials. This paper shows that judge turnover contributes negatively to delays in Italian courts and outlines possible policies for improvement. In Italy, judges can voluntarily move from one office to another after three years of mandate, and the law prescribes their transfer after ten years to guarantee their independence. Flaws in the process managing the backlog of outbound judges and the existence of asynchrony between outbound and inbound transfers produce a chain of delays to the disposition of court cases. Using a novel dataset on Court of Appeal Districts in Italy (2008-2012), we provide evidence of a strong negative relation between high turnover rates and judicial performance. We find that marginal increases in judge turnover rates lead to a statistically significant decrease in judicial performance over two years of time.
Keywords: judges, turnover, court administration, caseflow management, performance, judicial system.

1 Introduction

Italy is among the countries with the highest litigation rate[1] and those with the highest duration of trials.[2] Several contributions showed that judicial performance is negatively affected by a lack of human resources and of financial resources to face an increasing demand of justice (Marchesi, 2003, Carmignani and Giacomelli, 2009). Others found that the large number of lawyers may also be a factor of inefficacy on the demand side of justice (Carmignani and Giacomelli, 2010, Buonanno and Galizzi, 2014). Scholarly contributions have underlined the potential for improvements to mitigate the effect of such "production inefficiencies." Another strand of the literature has focused on the factors that could positively affect judicial performance without requiring additional resources. These factors mainly relate to degrees of formality of judicial procedures (Di Vita, 2010, Djankov, La Porta, Lopez-de Silanes, and Shleifer, 2003), number or organizational structure of courts (Antonelli and Grembi, 2013), incentives schemes for judges and lawyers (e.g., salary system: Choi, Gulati, and Posner, 2009, Lim, 2013), judges' productivity (Christensen and Szmer, 2012, Marciano and Khalil, 2012), and accountability (Goelzhauser, 2012).[3]

More recently, the empirical work on microdata from the Courts of Milan, Turin, and Rome found that the case scheduling method adopted by the individual judge is pivotal for the timely disposition of cases (Coviello, Ichino, and Persico, 2009, 2014a,b). This work has shown that – *ceteris paribus* – the average duration of a judge's trials can be reduced through the individual adoption of alternative task-scheduling methods, without altering the initial number of assigned cases. Our analysis builds on this literature by stressing the relevance of judge turnover as an additional organizational factor that negatively influences judicial performance.

The term "judge turnover" refers to a *voluntary* or *mandatory* transfer of a judge to another office.[4] Intuitively, each transfer entails the movement of two judges: the judge who leaves his current office (hereafter, "outbound judge"), and the judge who fills a vacancy ("inbound

[1]The OECD report "What makes effective civil justice?" (2013) shows that Italy is one of the countries with the highest litigation rates in civil justice (measured by the ratio of the number of active civil cases at first hearings and the average resident population or GDP), with four active cases per thousand inhabitants, as in Greece, Spain, and the Czech Republic. Finland is the country with the lowest litigation rate, with 0.3 active cases per thousand inhabitants. At the far end of the scale, Russia has about 10 cases per thousand inhabitants. See also Dakolias (1999) and Palumbo, Giupponi, Nunziata, and Mora-Sanguinetti (2013) for a comparative analysis on court performance around the world.

[2]According to the report "Doing Business", in 2014 Italy was ranked 103rd out of 188 world economies for efficiency of the judicial system (dimension: "enforcing contracts"). In Italy, an average of 1185 days are necessary for the disposition of a case, against the 529-day average of other OECD countries (data reported in June 2013, see Doing Business, 2014).

[3]For a discussion on some of the issues associated with delay in Italian courts, see Steelman and Fabri (2008). For a comprehensive overview of the most effective ways to use national resources to improve judicial systems, see Cross and Donelson (2010). See also Ramello and Voigt (2012) for a special issue on judicial efficiency examining the impact on social welfare and the opportunities for reform.

[4]For a wider description of the phenomenon, see Section 2.1.

judge"). To our knowledge, this phenomenon has never been analyzed either in the extensive debate on the determinants of courts' delay,[5] or in the literature on judges' careers in Europe.[6] In the absence of previous empirical studies on this phenomenon,[7] our investigation on judge turnover found initial support in — and contributes to — the literature on employee turnover, human resource stability and performance (Allen, Bryant, and Vardaman, 2010). Indeed, several contributions have already explored how and why employee turnover impacts performance in various professional settings, providing evidence of a negative effects of workforce turnover on firm performance outcomes (Staw, 1980, Kacmar, Andrews, Van Rooy, Steilberg, and Cerrone, 2006, Detert, Treviño, Burris, and Andiappan, 2007, Holtom, Mitchell, Lee, and Eberly, 2008, Hausknecht and Trevor, 2011), as well as on the performance of public institutions (e.g., Dolton and Newson, 2003, Ronfeldt, Loeb, and Wyckoff, 2013).[8]

This paper shows the presence of remarkably high turnover rates in Italian Court of Appeal Districts and provides the first empirical evidence of the impact of judge turnover on judicial performance. We build a novel panel dataset with data from two different sources. We collected data on civil and criminal cases filed between January 1, 2008, and December 31, 2012, using the statistics published by the Italian Ministry of Justice (*Ministero della Giustizia*). We obtained data from the High Council for the Judiciary (*Consiglio Superiore della Magistratura*) on the statutory and actual number of judges, the number of inbound and outbound judges in each Court of Appeal District for the same period. This latter data source is novel and, to our knowledge, it has never been used in previous studies. The final dataset used in our analyses allows us to observe 26 Court of Appeal Districts from 2008 to 2012.[9]

We build three variables to measure judge turnover: the separation rate, the accession rate, and the vacancy rate.[10] There are two reasons why judge turnover could negatively affect judicial performance. When a judge leaves her position, her pending cases are either suspended until the arrival of another judge, or temporarily reallocated among his colleagues for adjournment. In either situation, the inbound judge inherits the pending cases of the outbound colleague, and needs more time to study and evaluate each of them. The backlog of an outbound judge basically becomes a batch of "new" cases for the inbound judge. Thus, the first inefficiency produced by judge turnover is related to the flaws in the management of the pending cases of the "original" judge. The second reason is related to vacant positions: if a judge leaves her office and the position is not filled in the short run (i.e., within a year), her pending cases re-

[5]For a general overview of the topic, see Voigt and El-Bialy (2016). See also Palumbo et al. (2013) and Castro and Guccio (2014).

[6]See, among others, Di Federico (2005) and Garoupa, Gili, and Gómez-Pomar (2012).

[7]The discussion on judge turnover and the timely disposition of trials has been raised in the Italian press by Coviello, Ichino, and Persico (2010) and Ichino (2010). This discussion has not yet been followed by an empirical investigation at the national level. For a legal discussion on judicial transfers in Japan, see Ramseyer (2007).

[8]For a review of this literature, we refer the reader to Section 2.2.

[9]For a more detailed description of the data, please refer to Section 3.

[10]See Section 3 for the definitions of these indexes.

main suspended with no judges effectively working on them. By estimating a first-difference regression model with distributed lags and year fixed effects,[11] this paper shows that marginal increases in the percentages of inbound judges and of vacancy positions negatively affect the resolution rate of both civil and criminal cases.

Despite the lack of published empirical evidence, practitioners and judges alike have a clear perception of the existence of flaws in the process of managing the backlog of outbound judges. For instance, the suspension of pending cases until the new judge has arrived, the temporary reallocation of cases among colleagues who have to reorganize their calendar of case hearings, the existence of an asynchrony between outbound and inbound transfers (without handover periods), the rescheduling of tasks by the inbound judge unavoidably produce a chain of delays that is detrimental for a timely resolution of cases. This paper provides empirical support of these flaws and substantially contribute to the literature on judicial efficiency as it shows that a rethinking of current judge turnover policies may lead to a reduction of the average congestion rate of trials. Our aim is ultimately to propose practical solutions to solve the problem, including a more efficient coordination between inbound and outbound transfers, clearer policies on how to dispose outbound judges' backlogs, and more effective practices to organize the work of judges.

The paper proceeds as follows. Section 2 contains the institutional framework and reviews the literature on the effects of employee turnover on performance in different professional settings; Section 3 describes the data; Section 4 provides descriptive evidence on the correlation between judge turnover and the judicial performance, describes the regression model that we estimate and presents the main results. Section 5 discusses the results and their policy implications, and provides a simple comparative analysis with the case of Texas.

2 Institutional Framework and Literature Review

2.1 Institutional Framework

In Italy, judges can move from one office to another to fill a vacant position. The word "office" here indicates both the *job* (*function*) performed by a judge in one Court (or one department of it), and the *organizational unit* (*place*) where the judge carries out his service.

The "transfer" of a judge consists of the nomination of a judge to an office different from her current one. In practice, the transfer requires the judge to leave his current position and to take on the caseload of another judge in a different room that is either in the same Court or in a different one. The backlog of an outbound judge is either suspended until the arrival of another judge, or is temporarily assigned to her colleagues for adjournment.

[11] For details on the empirical strategy and specification, please refer to Section 4.

Turnover is ubiquitous in organizations, and this naturally includes judicial organizational units. However, judge turnover in Italian courts differs remarkably from employee turnover in private-sector companies in at least three respects. First, judges are somehow in-between the statuses of "public employee" and "independent professional." They are the former because their job is carried out as a public service in organizations governed by the Italian Ministry of Justice. They are the latter because Italian judges and prosecutors are not employees of the Ministry of Justice (unlike court clerks and administrative personnel), but are "*created and regulated by the laws of the judicial system" (art. 102 Const.; arts. 1 and 4 Royal Decree no. 12 of 30th January, 1941). They have a separate status from other judges, which derives from a) the privilege of independence envisaged by the Constitution (arts. 101-104 Const.) and also b) the fact that they are subject to the authority of their self-governing body: the Consiglio Superiore della Magistratura [tr. High Council for the Judiciary] (in respect of the C.S.M.'s constitution and operation, see Law no. 195 of 24th March, 1958, and Presidential Decree no. 916 of 16th September, 1958).*[12] This entails that judges can neither have their salary determined nor be fired, nor be transferred at will by the Ministry of Justice. Briefly, the Ministry of Justice is responsible for organizing the structures where judges work: buildings and administrative staff. This is a feature of how the judicial system is organized in Italy.

Second, as shown below, the transfer of a judge is almost always *voluntary* (technically, *on request*) and is regulated and approved by the High Council for the Judiciary (arts. 192 and 194 Ord. Giud. and, more specifically, in Circular 8 June, 2009, n. 12046 and following amendments). On the contrary, in companies, employers are allowed – if certain conditions are met – to enforce the mandatory transfer of employees to other departments, to change the employees' salary (with bonuses, etc.), and even to lay them off. The *mandatory* transfer of judges is envisaged by the law (art. 1, paragraph 1, Law no. 133/1998), but is quite rare and normally reserved for exceptional circumstances. This is a body of rules enacted to preserve judicial independence.

Third, the decision to transfer a judge is taken by the High Council for the Judiciary, regardless of caseload or judicial performance, through calls of interest (public competitions) issued periodically and regulated by the High Council for the Judiciary. In private companies, transfers occur under a different logic: normally vacant positions are almost instantaneously filled by other employees to avert or mitigate production inefficiencies or other harmful consequences of the transfer to the production unit.

There are constitutional reasons underlying these striking differences with employee transfers in the private sector, and tracing a systematic framework of judicial transfers in the Italian legal system is truly a challenge. The Italian Constitution guarantees the independence and the

[12]For a detailed description of the Italian Judicial System in English, see the report available at http://www.csm.it/documenti%20pdf/sistema%20giudiziario%20italiano/inglese.pdf (Last access: 22 April 2015).

impartiality of judges by allowing transfer to another office (art. 104 Const., first paragraph). The judge can be exempted or suspended from his service or transferred to another office only following a deliberation of the High Council for the Judiciary adopted with the consent of the judge (art. 106 Const., first paragraph).

It is worth noting that the comparative analysis of the Italian institutional framework with other jurisdictions has proven a difficult task, mainly because the study of judge turnover has been neglected thus far and the data for comparative analyses are largely absent or difficult to obtain. We may conjecture that the findings presented for Italy in our paper hold true and can be generalized to judge turnover in other jurisdictions, regardless of legal traditions and judicial systems. To support this claim, we provide some data on judge turnover in Texas (see the details in Section 5). The comparison of judge turnover in Italy and Texas suggests that besides the differences between the two judicial systems, turnover rates were similar in the two countries during 2008-2012 and judicial performance was still negatively associated with judge turnover. We are aware that further empirical investigations and comparative analyses between different jurisdictions are necessary for a complete overview of this phenomenon.

Earlier, we drew the legal distinction between voluntary and mandatory transfers. with respect to the direction of the transfer, we shall also distinguish *inbound* and *outbound* transfers: inbound transfers fill out positions that were vacant, whilst outbound transfers create vacant positions. The motivation for a transfer may be *internal* or *external*. Internal motivations concern the judge's desire to change location or functions for any reason (for example, family reunification to career ambitions). External motivations derive from a need of the Judiciary to fill vacant position, such as in "disadvantaged locations" [it. *Sedi disagiate*] (located mainly in regions highly affected by organized crime, and periodically listed by the High Council for the Judiciary).[13] Regardless of the type of transfer, two important rules apply. The first is that once a judge takes on the new position she cannot apply for a new transfer or be assigned to another office for a period of three years, except in case of serious illness, service, or family reasons (art. 194 Ord. Giud.). As we can see, the rule is vague enough to allow early applications. Another important rule requires judges to remain in the same position with the same functions for

[13]For the scope of our analysis, we limit our attention to inbound and outbound transfers with no further distinctions. For completeness, we shall mention that there are different types of transfers: they can be permanent or temporary and may physically occur from one town to another, as well as from one office to another of the same court, whereby the judge can engage in transfers that may concern the place or the specific function that she carries out in an office (for respective examples, from the Court of Bologna to the Court of Milan, or from prosecutor to ordinary judge in a civil court). Transfers may occur within the same jurisdictional level (for example, a transfer between two courts of appeal, or within the same court of appeal in different departments [it. *sezioni*]): in this case, we define the transfer as horizontal. They may also occur across levels (for example, from ordinary court to supreme court, or from judge to president of the court), whereby in this case we define the transfer as vertical. We could not perform a more detailed analysis per type of transfer given that the Italian Higher Council of the Judiciary does not release this information due to data access restrictions under the Italian Privacy Law (as it is contained in the personal records of each judge).

a minimum of five[14] and a maximum of ten years (art. 19 Legislative Decree n. 160/2006). This rule is certainly enforced, although – as we will describe below – judges are rarely transferred for having reached the end of the ten-years period.

This paper uses novel data on Italy during 2008-2012, and shows that, under the current institutional framework, judge turnover negatively affects judicial performance, increasing the congestion rate as well as reducing the resolution rate of both civil and criminal cases. This suggests that the current regulation of judge turnover can be either improved or extended to reduce its negative consequences on judicial performance.

2.2 Turnover and Performance: A Literature Review

Despite the lack of interest concerning how and why judge turnover influences judicial performance, the effects of employee turnover on performance in other professional organizations have received growing attention among management and labor scholars (Glebbeek and Bax, 2004). The most common assumption regarding the relationship between turnover rates and organizational performance is that increasing turnover rates should have a dysfunctional effect on organizational performance. The empirical evidence tends to support these detrimental effects (Hausknecht and Trevor, 2011). Three are the main theoretical perspectives that conceptually explain the effect of turnover rates on organizational performance (Hancock, Allen, Bosco, McDaniel, and Pierce, 2013): (a) cost-based perspective (e.g., Dalton and Todor, 1979), (b) human capital perspective (e.g., Becker, 1980), and (c) social capital perspective (e.g., Leana and Van Buren, 1999). Following the cost-based perspective, turnover affects organizational performance owing to the direct and indirect costs associated with managing employee exits. Among others, Allen et al. (2010) identified several separation and replacement costs associated with turnover, such as salary owed, benefits, accrued vacation time, interviewing, advertising and training costs. Following the human capital perspective, turnover affects organizational performance because it leads to the loss of valuable knowledge and skills that employees have developed through experience and training (e.g., Becker, 1980; Dess and Shaw, 2001). Similarly, following the social capital perspective, turnover affects organizational performance because employees gather capital and resources embedded in social relationships that cannot be easily replaced when they depart (e.g., Shaw, Duffy, Johnson, and Lockhart, 2005). These conceptual perspectives find support in studies finding negative relationships between turnover rates and sales performance (Kacmar et al., 2006), cost-effectiveness (Alexander, Bloom, and Nuchols, 1994), and productivity (Brown and Medoff, 1978). The majority of evidence appears to support the dysfunctional effects of turnover rates on performance (Arthur, 1994, Koys, 2001, McElroy, Morrow, and Rude, 2001, Batt, 2002 Detert et al., 2007, Hausknecht, Trevor, and Howard, 2009, Hausknecht and Trevor, 2011). In their meta-analytic review of employee turnover as a

[14]Three years, if conditions for exceptions envisaged by art. 194 Ord. Giud. apply.

predictor of firm performance, Hancock et al., 2013 provided evidence of a significant, negative relationship between turnover and organizational performance, stating that "the costs and human and social capital losses associated with turnover tend to outweigh the potentially functional effects of replacing departing employees with better or less expensive ones, bringing new perspectives into the organization, or preventing human stagnation."

It is worth mentioning that there is also evidence on some functional effects of turnover when the potential benefits associated with turnover mitigate or in some cases outweigh the costs. For example, a certain amount of turnover has proven be useful in reducing stagnation and improving innovation (Abelson and Baysinger, 1984), as well as replacing poor performers (or those who do not fit within the organizational culture) with relatively higher performing new employees (Dalton and Todor, 1979; Abelson and Baysinger, 1984). More recently, Seleim, Ashour, and Bontis (2007) lied on a sample of software development organizations and found a positive relationship between the departure of software developers and the level of export intensity. Similarly, Siebert and Zubanov (2009) observed a positive relationship between turnover and labor productivity for part-time sales assistants.

These mixed results have encouraged scholars to test for the existence of a curvilinear turnover-performance relationship (e.g., Shaw et al., 2005) and to find the optimal level of turnover for specific contexts (e.g., Glebbeek and Bax, 2004). If – at one end – turnover can be too low, leading to stagnation, homogeneity, high benefit costs and limited exit of poor performers, at the other end turnover can be too high, leading to increased recruiting, training, and separation costs as well as the irreplaceable loss of human and social capital (Hancock et al., 2013).

3 Data

3.1 Data sources and novel dataset

For our empirical investigation, we combined two official sources: data from the Ministry of Justice (it. *Ministero della Giustizia*) and data from the High Council for the Judiciary (it. *Consiglio Superiore della Magistratura*). The data from the Ministry of Justice contain information about the yearly performance of each court office of each of the 26 Italian Court of Appeal Districts: number of filed cases, of resolved cases, and of pending cases, as well as the average duration of trials.[15] We collected information of civil and criminal cases filed between January 1, 2008, and December 31, 2012.

We obtained access to the database of judge turnover in court offices from the High Council for the Judiciary for the same period, from January 1, 2008 to December 31, 2012. This data

[15]Data available online at http://webstat.giustizia.it/ (Last access: 18 April 2015).

have never been used before. From this source, we collected data on the actual and statutory number of judges and the number of inbound and outbound judges. These two data sources have a similar structure: the observation units are the 26 Court of Appeal Districts (it. *Distretti di Corte di Appello*), and the period analyzed ranges between January 1, 2008 and December 31, 2012. For each District, the final dataset contains information about the following court offices: 26 courts of appeal (it. *corti di appello*), 165 ordinary courts (it. *tribunali ordinari*), 29 juvenile courts (it. *tribunali per i minorenni*), 26 prosecutor's offices at the court of appeal (it. *procure generale della repubblica presso la corte di appello*), 140 prosecutor's offices at the ordinary court (it. *procure della repubblica presso il tribunale ordinario*), and 29 prosecutor's offices at the juvenile court (it. *procure della repubblica presso il tribunale per i minorenni*).[16] Table 1 shows the geographic distribution of the 26 Court of Appeal Districts. The Districts are located in correspondence to the regional chief towns (except for the city of Aosta, which is included within the District of Turin).

[Table 1 about here]

[16]For an overview of Italian Court organization and procedure, see Steelman and Fabri (2008). We did not perform analyses on Judges of the Peace (it. *giudici di pace*) because they are honorary magistrates and are not captured by the HJC data. Similarly, we did not perform analyses on judges working in 29 Surveillance Offices because (1) they are partly honorary magistrates and partly not; (2) they "surveil" the application of the criminal sanction once a final decision on the criminal case has been taken.

Table 1: *Geographical Distribution of Court of Appeal Districts*

Macro Region	Administrative Region	Court of Appeal District
North	Emilia-Romagna	Bologna
	Friuli-Venezia Giulia	Trieste
	Liguria	Genoa
	Lombardy	Brescia
	Lombardy	Milan
	Piedmont e Valle d'Aosta	Turin
	Trentino-Alto Adige	Trento
	Veneto	Venice
Center	Lazio	Rome
	Marche	Ancona
	Tuscany	Florence
	Umbria	Perugia
South and Islands	Abruzzo	L'Aquila
	Basilicata	Potenza
	Calabria	Catanzaro
	Calabria	Reggio Calabria
	Campania	Naples
	Campania	Salerno
	Molise	Campobasso
	Puglia	Bari
	Puglia	Lecce
	Sardinia	Cagliari
	Sicily	Messina
	Sicily	Catania
	Sicily	Palermo
	Sicily	Caltanissetta

Source: Authors' elaboration of data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

In the following, we shall describe the main variables of our analysis, i.e., the measures for judge turnover and judicial performance. Table 2 provides a short description of these variables and Table 3 shows the summary statistics at the district level.

[Tables 2 and 3 about here]

Table 2: *Variable Description*

Variable	Description
Volume of cases:	
Resolved cases	Number of cases resolved in the year
Newly filed cases	Number of newly filed cases in the year
Pending cases	Number of pending cases at the beginning of the year
Caseload	Sum of pending cases at the beginning of the year and the newly filed cases in the year.
Judicial Performance:	
Congestion rate	Ratio between the caseload and the number of resolved cases.
Resolution rate	Ratio between the number of resolved cases and the caseload.
Number of judges:	
Inbound Judges	Number of inbound judges
Outbound judges	Number of outbound judges
Actual no. of judges	Actual number of judges
Statutory number of judges	Number of judges as prescribed by statutory provisions.
Judges' turnover:	
Separation rate	Percentage of outbound judges over the statutory number of judges
Replacement rate	Percentage of inbound judges over the statutory number of judges
Vacancy rate	Percentage of outbound judges minus inbound judges over the statutory number of judges
Flux rate	Percentage of outbound judges plus inbound over the statutory number of judges

Notes: This Table describes the variables used throughout the analysis.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Table 3: *Summary Statistics (District Level, 2008-2012)*

Variable	Mean	Std. Dev.	Min	Max	Obs.
Volume of cases:					
Resolved cases	229,653.6	174,433.389	35,470	736,347	130
Newly filed cases	233,041.254	175,354.969	35,742	701,577	130
Pending cases[1]	279,082.877	227,499.636	36,202	1,063,744	130
Judicial Performance:					
Congestion rate	2.247	0.33	1.509	2.956	130
Resolution rate	0.455	0.07	0.338	0.662	130
Number of judges:					
Inbound Judges	38.908	35.621	4	215	130
Outbound judges	44.623	38.519	5	228	130
Actual no. of judges	323.062	259.98	43	1,122	130
Expected no. of judges	324.231	249.131	53	1,004	130
Judges' turnover:					
Separation rate	13.983	4.478	3.922	25.641	130
Replacement rate	12.039	4.98	3.354	24.832	130
Vacancy rate	1.944	4.159	-11.111	20.513	130
Flux rate	26.021	8.509	8.497	47.651	130

Notes: This Table shows the dependent variables, the control (independent variables) used throughout the paper. The unit of observation is the Court of Appeal District and the reference period is 2008 - 2012. Thereby, the panel dataset contains information on 26 Court of Appeal Districts for 5 years of time (i.e., the number of observations is 130). The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases. The caseload is the sum of pending cases from previous periods and the newly filed cases from the current year. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where "statutory number of judges" is the number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the statutory number of judges. The variable *Vacancy rate* is computed as the difference between the separation and the accession rates. The variable *Flux rate* is computed as the percentage of inbound and outbound judges over the total statutory number of judges.
[1] Pending cases measured at the beginning of the year.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

3.2 Measures of Judge Turnover

To our knowledge, judge turnover has not yet been studied empirically in Italy or in other jurisdictions.[17] Since we could not rely on previous work to select measures of judge turnover already in use, we relied upon the managerial literature on employees' turnover to construct two variables: the separation rate and the accession rate. From these two rates, we further built the flux rate and the vacancy rate.

The separation rate is computed as the percentage of outbound employees over the total workforce.[18] In our context, the separation rate becomes:

$$\text{Separation Rate}_{i,t} = 100 \times \frac{\text{number of outbound judges}_{i,t}}{\text{statutory number of judges}_{i,t}},$$

where "statutory number of judges" is the total number of judges as prescribed by statutory provisions, and i represents the i-th Court of Appeal District at the year t. The statutory number of judges could (and actually does) differ from the actual number of judges in service (Table 4). To measure judge turnover, the expected number should be preferred to the actual number of judges because, among other things, the actual number of judges varies also with the inbound and outbound judges in the current and past years.

[Table 4 about here]

[17] A cursory search in literature germane to judge turnover pointed to the mobility of judges. In this field, we find few empirical studies, of which the main one is Quassoli and Stefanizzi (2002).

[18] This measure of turnover is mainly used to study the effects of employees' layoffs and resignations on firms' performance. Given the organizational costs of a layoff, which includes the search and the recruitment of new employees, understanding employees' layoffs or dismissals is a real need for firms and organizations alike. Huselid (1995) found a negative correlation between employees' skills and a turnover index computed using the separation rate method by analyzing layoffs and dismissals in 12,000 American public firms.

Table 4: *Number of Judges, by Year and Macro-Regions (Average at District Level)*

Year	Macro-Reg.	Number of Judges				
		Inbound	Outbound	Expected	Actual	Understaffing
2008	North	31	41.875	370.125	369.25	0.405
	Center	41.5	44.25	401.75	424.75	-4.056
	South	24.071	38.714	275.857	272.5	1.961
2009	North	60.75	57.125	370.125	388.125	-3.965
	Center	79	85	401.75	459.5	-9.736
	South	49.142	50	275.857	282.928	-0.034
2010	North	39.5	49.5	370.125	370.5	0.211
	Center	57	66.25	401.75	431.5	-3.189
	South	43.5	47.428	275.857	276.5	1.544
2011	North	38.875	45.5	370.125	359.875	4.0240
	Center	52.75	63	401.75	418	-0.655
	South	38.071	38.428	275.857	267.5	4.296
2012	North	25.75	32.875	370.125	340.75	7.922
	Center	34	35.5	401.75	390.25	4.663
	South	19.071	26.142	275.857	248.714	11.573
Average	North	39.18	45.38	370.13	365.70	1.72
	Center	52.85	58.80	401.75	424.80	-2.60
	South	34.77	40.14	275.86	269.63	3.87

Notes: The abbreviation *Macro-Reg.* stands for Macro-Regions. The Macro-Region "South" includes also the Islands. The variable *Expected* represents the number of judges as prescribed by statutory provisions. The variable *Understaffing* is measured as the percentage of expected judges minus actual judges over expected judges. The *Average* is computed as the five-year average of the variables at the district level.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

The turnover index computed using the accession rate method considers the percentage of inbound employees over the total workforce. This index is commonly compared with the separation rate. In our context, the accession rate becomes:

$$\text{Accession Rate}_{i,t} = 100 \times \frac{\text{number of inbound judges}_{i,t}}{\text{statutory number of judges}_{i,t}}.$$

The vacancy rate is computed as the difference between the separation and the accession rates:

$$\text{Vacancy Rate}_{i,t} = 100 \times \frac{\text{number of outbound}_{i,t} \text{ - number of inbound judges}_{i,t}}{\text{statutory number of judges}_{i,t}}.$$

where i represents the $i-th$ Court of Appeal District at the year t.

Another conventional measure for employees' turnover is the flux rate, that considers the percentage of both inbound and outbound employees over the total workload. In our context, this is computed as:

$$\text{Flux Rate}_{i,t} = 100 \times \frac{\text{number of outbound}_{i,t} + \text{number of inbound judges}_{i,t}}{\text{statutory number of judges}_{i,t}}.$$

This measure is commonly used in labor economics to analyze fluctuations of employment and unemployment rates (Goddard, 1927), and to study heterogeneity in employee turnover rates depending on the characteristics of the employment sector and firm size (Davis, Haltiwanger, and Schuh, 1998, Abowd, Corbel, and Kramarz, 1999, Centeno, Machado, and Novo, 2009). In our context this measure is less accurate because it does not allow to distinguish the double effect of judges' transfers on judicial performance.

3.3 Measures of Judicial Performance

For each Court of Appeal District we computed two widely used measures of judicial performance: the congestion rate and the resolution rate (CEPEJ, 2012, García-Posada and Mora-Sanguinetti, 2015, Voigt and El-Bialy, 2016):[19]

$$\text{Congestion Rate}_{i,t} = \frac{\text{Pending Cases}_{i,t-1} + \text{New Filed Cases}_{i,t}}{\text{Resolved Cases}_{i,t}}.$$

$$\text{Resolution Rate}_{i,t} = \frac{\text{Resolved Cases}_{i,t}}{\text{Pending Cases}_{i,t-1} + \text{New Filed Cases}_{i,t}}.$$

where i represents the $i-th$ Court of Appeal District at the year t or $t-1$.

The congestion rate is measured by the entire caseload divided by the number of resolved cases. The caseload is the sum of pending cases from previous periods and the newly filed cases from the current year. Intuitively, a lower congestion rate is related to greater efficacy of the procedures inside the judicial system. More specifically, a congestion rate greater than 1 indicates that the District has not satisfied the demand for justice and the backlog will inevitably increase. For instance, let us suppose that in a specific year 500 new cases were filed to the court and 200 cases were pending from the previous year. If the court was able to dispose 700 cases in that year, the congestion rate is 1, meaning that the court was able to resolve all the cases in that year. If the court would instead complete 200 cases, the congestion rate increases to 3.5, meaning that 3 cases and a half were still awaiting resolution while the court was able to

[19] CEPEJ, 2012 uses also other measures for judicial performance, namely the clearance rate and the disposition time. The clearance rate is defined as the number of resolved cases divided by the number of newly filed cases. This measure considers only the cases filed within the year at the denominator and might be misleading when the stock of pending cases significantly exceeds the number of newly filed cases (Voigt and El-Bialy, 2016). The disposition time is an estimate of the time needed to resolve a case and is computed as the ratio between resolved cases and pending cases (measured at the end of the year) multiplied by 365. For one application of this measure, see Goelzhauser (2012). However, this measure of duration is based on steady state assumptions (e.g., in the first year of courts' existence). Since our estimations are instead based on the assumption that courts are not in the steady state, this measure, despite being a reasonable proxy for duration, introduces unnecessary noise. Another possible measure can be court productivity, which is the number of resolved cases per judge. However, our data do not allow us to use this measure since we cannot exactly observe the share of judges responsible for solving each type of case. As pointed out by Voigt and El-Bialy (2016), we cannot proceed by aggregating all resolved cases and divide them by the number of judges, because heterogeneous cases require different amounts of time and resources to be resolved.

resolve just one. By considering an example from our data, an average congestion rate for the civil cases of 4.6 in the Court of Appeal of Rome in 2009 indicates that around 4 cases and a half were awaiting resolution while the courts were able to resolve just one.

The resolution rate is defined as the number of resolved cases divided by the entire caseload. A higher ratio means that a court is able to satisfy the demand of justice and to avoid substantial backlogs. In other words, a high resolution rate signals high judicial performance. More specifically, a resolution rate lower than 1 indicates that courts were not able to satisfy the demand of justice and the backlog will inevitably increase. Back to the previous example, if the court would complete 200 cases over a caseload of 700 (pending plus newly filed cases), the resolution rate is 0.28, meaning that the court was able to revolve 2 cases while 7 were still awaiting resolution. By considering another example from our data, a five-year average resolution rate for the civil cases of 0.4 in the average Court of Appeal District in South Italy over the period 2008-2012 indicates that the average District was able to dispose on 2 cases while 5 were still awaiting resolution, that is, less than a half of the total caseload.

The two measures for judicial performance are not surprisingly highly correlated.[20] However, the resolution rate has the advantage of having a quite normal distribution, so corrections for high skewness are not required, unlike the case of the congestion rate. As a final remark, it is worth stressing that these two measures are objective and commonly used in the literature, but they both share a common shortcoming: they do not account for the quality of decisions.[21]

4 Empirical Analysis

In this section, we show that changes in judge turnover lead to subsequent changes in judicial performance. We proceed stepwise as follows: we present descriptive evidence for the facts we want to explain (Section 4.1); we then describe the empirical specification employed to estimate this effect and we illustrate the results (Section 4.2).

4.1 Descriptive Evidence

Our conjecture as to the negative effect of judge turnover on judicial performance finds initial support from descriptive statistics. On a five-year average over the period 2008-2012, in the average Court of Appeal District of Italy, 45 judges out of 324 (i.e., around 14%) leave their position and around 39 judges out of 324 (i.e., 12%) assume a new position (Tables 3 and 5). The asynchrony between inbound and outbound transfers generate an averaged vacancy rate

[20] The coefficient of correlation between the five-year averaged resolution and congestion rates at the district level is equal to -0.9818 (p-value: 0.000).

[21] The data provided by the Ministry of Justice and the High Council of the Judiciary do not allow us to control for the number of successful appeals (or, equivalently, the number of reversed decision in appeal), that would be a good proxy for the quality of decisions. See also Voigt and El-Bialy (2016) on this point.

of 2%, meaning that in the average Italian District, around 6 positions out of 324 are not filled within the year.

The Italian regions with the highest separation rate, i.e., percentage of outbound judges, are Basilicata (Potenza: 17.92%), Calabria (Reggio Calabria: 16.46%; Catanzaro: 16.12%), Lazio (Rome: 15.54%) and Molise (Campobasso: 15.47%) (Table 6 and Figure 1, "Separation rate"). The regions with the highest accession rate, i.e., percentage of inbound judges, are Abruzzo (L'Aquila: 15.20%), Calabria (Reggio Calabria: 15.15%; Catanzaro: 13.29%), Lazio (Rome: 13.98%) and Toscana (Florence: 12.75%) (Table 6 and Figure 1, "Accession rate"). The highest vacancy rates are recorded in Molise (Campobasso: 5.28%), Basilicata (Potenza: 4.17%), Marche (Ancona: 2.89%) and Piemonte (Turin: 2.51%) (Table 6 and Figure 1, "Vacancy rate"). On the contrary, the regions with the lowest separation rates are Friuli-Venezia Giulia (Trieste: 10.2%), Liguria (Genoa: 11.31%) and Umbria (Perugia: 11.6%); with the lowest accession rates are Sardegna (Cagliari: 9.41%), Friuli-Venezia Giulia (Trieste: 9.54%) and Piemonte (Turin: 9.91%); with the lowest the vacancy rates are Abruzzo (L'Aquila: -0.35%), Umbria (Perugia: 0.4%) and Friuli-Venezia Giulia (Trieste: 0.65%).

Approximatively, a representative judge processes an average of more than 1,500 active cases each year. Since every outbound transfer entails the temporarily suspension or reallocation of the pending cases of the transferred judge, every year approximately more than 180 active cases are suspended (or otherwise reassigned) until the arrival of the "new" inbound judges. The change of the "original" judge has the potential to produce a chain of delays in the disposition of the outbound judge's pending cases. In this regard, it is worth noting that the Italian regions with the highest (lowest) judge turnover have also a high (low) congestion rate and low (high) resolution rate (Table 6 and Figure 2). Basilicata (2.64), Calabria (2.62), Puglia (2.61), Campania (2.54), Sicily (2.45) and Lazio (2.34) are the regions with the highest congestion rates; whereas Trentino-Alto Adige (1.55), Friuli-Venezia Giulia (1.71), Piemonte (1.94), Marche (1.94), and Abruzzo (1.94) record the lowest congestion rates. We will come back to this correlation below in this section.

Another interesting lesson from the empirical evidence comes from the trends of the judge turnover and judicial performance over time. Let us consider the situation in the macro-regions, namely the North, the Center, and the South of Italy (for a general overview, see Table 7). In the two graphs in Figure 5, the solid lines represent the congestion rate (for both civil and criminal cases) and the dotted lines represent the judge turnover measured with separation and accession rates. The variables are measured as averages at the district level. Thus, the graphs in Figure 5 show the situation in the average District of the North, Center, and South of Italy. It can be noticed that when either rates increases in a specific year, the congestion rate increases in the same year or after one or two years. Let us consider for example the time series of the separation rate (i.e., percentage of outbound judges) in a District of the North of Italy. From

2008 to 2009, the separation rate increased from 11.68 to 15.54, then decreased (13.79 in 2010; 10.94 in 2011; 8.48 in 2012). In the same period, from 2008 to 2009, the replacement rate (i.e., percentage of inbound judges) increased from 8.54 to 16.05, and then decreased (11.36 in 2010; 9.98 in 2011; 6.86 in 2012). The time series of the congestion rate followed a similar trend, after one year: it increased from 1.92 to 1.93 in the period 2009-2010, from 1.93 to 1.94 in the period 2010-2011, and then decreased. Similar patterns are found on average in the Districts of the Center and South of Italy: the increase in judge turnover in the period 2008-2009 is followed by a corresponding increase in the congestion rate during 2010-2012. The trends of judge turnover and – similar, but apparently "lagged" – congestion rate are common to all the three macro-regions considered.

The evidence observed in the three macro-regions is representative of a general trend: Figure 3 shows the time series of the judge turnover rates and congestion rates in the average Court of Appeal District (without further distinguishing between macro-regions). It can be noticed that the increase of judge turnover from 2008 to 2009 is followed by an increase in the congestion rate from 2009 to 2011. This potentially signals a negative relationship between judge turnover and judicial performance.

To better appreciate this relationship, Figure 4 plots the five-year averaged judge turnover and congestion rate at the district level. On average, we observe a statistically significant and positive correlation between separation rate and congestion rate (correlation coefficient=0.6, p-value=0.001). The Districts with a higher percentage of outbound judges present a higher congestion rate. Similarly, there is a statistically significant and positive correlation between accession rate and congestion rate (correlation coefficient=0.63, p-value=0.000).

In conclusion, we summarize four main results from the statistical evidence: (a) every year, on average, each Court of Appeal District records high percentages of inbound and outbound judges, as well as a positive vacancy rate; (b) judge turnover rate and judicial performance vary across Italian regions and Court of Appeal Districts; (c) changes in judge turnover seem to predict subsequent changes in correlation rates after one year; (d) there exists a strong correlation between judge turnover and congestion rate. In the following section we will describe the econometric specification and show the results.

[Table 5 about here.]

[Table 6 and Figure 1 about here.]

[Figure 2 about here.]

[Figure 3 about here.]

[Figure 4 about here.]

[Table 7 and Figure 5 about here.]

Table 5: *Judicial Performance and Judges' Turnover, by Year (Average at District Level)*

Year	Volume of Cases		Judicial Performance		Number of Judges			Judges' Turnover		
	Caseload	Resolved	Congestion	Resolution	Outbound	Inbound	Actual	Separation	Accession	Vacancies
2008	509,704.8	225,030.4	2.27	0.45	40.54	28.88	325.69	13.73	9.17	4.56
2009	515,853.9	233,007	2.22	0.46	57.58	57.31	342.46	17.03	17.03	0.01
2010	517,133.2	233,209.6	2.23	0.46	50.96	44.35	329.27	16.01	13.89	2.13
2011	509,035.3	227,245.9	2.27	0.45	44.38	40.58	319.08	13.48	12.88	0.60
2012	508,893.5	229,775.1	2.21	0.46	29.65	23.42	298.81	9.65	7.23	2.42
Average	512,124.1	229,653.6	2.24	0.46	44.62	38.91	323.06	13.98	12.04	1.94

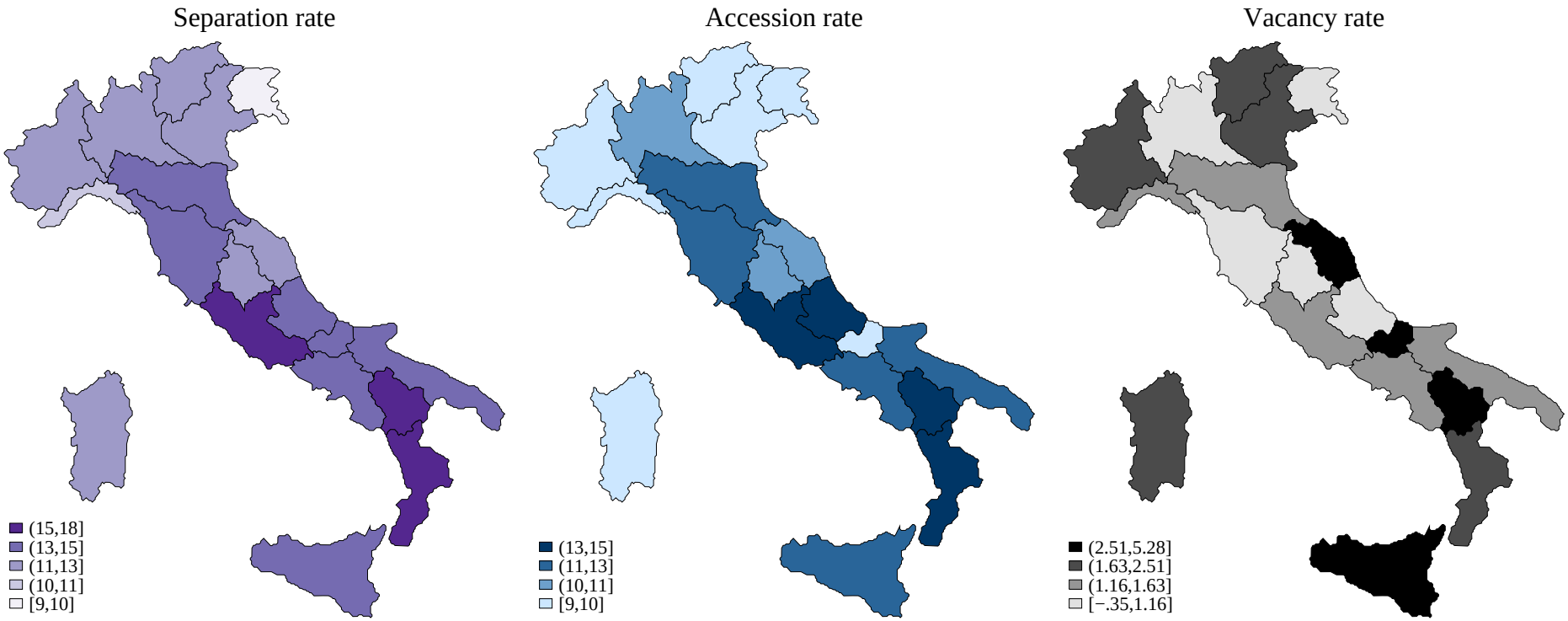
Notes: This Table shows the yearly averages at the district level of the volume of cases, number of judges, congestion and resolution rates, and judge turnover rates. The variable *Caseload* is the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where "statutory number of judges" is the total number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the total statutory number of judges. The variable *Vacancy rate* is computed as the difference between the separation and the accession rates. The yearly averaged statutory number of judges at the district level is time-invariant and is equal to 324.23. The *Average* is computed as the five-year average of the variables at the district level.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Table 6: *Judges' Turnover and Judicial Performance, by Court of Appeal District (Five-Year Average at District Level, 2008-2012)*

Macro-Region	Region	District	Judges' Turnover			Judicial Performance	
			Separation	Accession	Vacancies	Congestion	Resolution
North	Emilia-Romagna	Bologna	14.08	12.91	1.17	2.06	0.49
	Friuli-V.G.	Trieste	10.20	9.54	0.65	1.71	0.58
	Liguria	Genoa	11.31	10.04	1.27	1.98	0.51
	Lombardia	Brescia	11.84	11.27	0.57	2.16	0.46
	Lombardia	Milan	11.88	10.14	1.74	1.99	0.50
	Piemonte	Turin	12.42	9.91	2.51	1.94	0.52
	Trentino-A.A.	Trento	12.32	10.18	2.14	1.55	0.65
	Veneto	Venice	12.66	10.49	2.17	2.08	0.48
Center	Lazio	Rome	15.54	13.98	1.56	2.34	0.43
	Marche	Ancona	13.46	10.57	2.89	1.94	0.51
	Toscana	Florence	13.77	12.75	1.02	2.09	0.48
	Umbria	Perugia	11.60	11.20	0.40	2.31	0.43
South	Abruzzo	L'Aquila	14.85	15.20	-0.35	1.94	0.51
	Basilicata	Potenza	17.92	13.75	4.17	2.64	0.38
	Calabria	Catanzaro	16.12	13.29	2.84	2.59	0.39
	Calabria	Reggio Calabria	16.46	15.15	1.31	2.65	0.38
	Campania	Naples	14.30	12.47	1.83	2.40	0.42
	Campania	Salerno	14.76	13.33	1.43	2.69	0.37
	Molise	Campobasso	15.47	10.19	5.28	2.04	0.49
	Puglia	Bari	14.57	13.66	0.91	2.74	0.37
	Puglia	Lecce	14.80	12.91	1.89	2.49	0.40
	Sardegna	Cagliari	11.78	9.41	2.37	2.30	0.43
	Sicilia	Caltanissetta	18.29	13.85	4.44	2.21	0.45
	Sicilia	Catania	12.99	11.34	1.65	2.50	0.40
	Sicilia	Messina	17.58	15.03	2.55	2.82	0.35
	Sicilia	Palermo	12.56	10.45	2.11	2.24	0.45

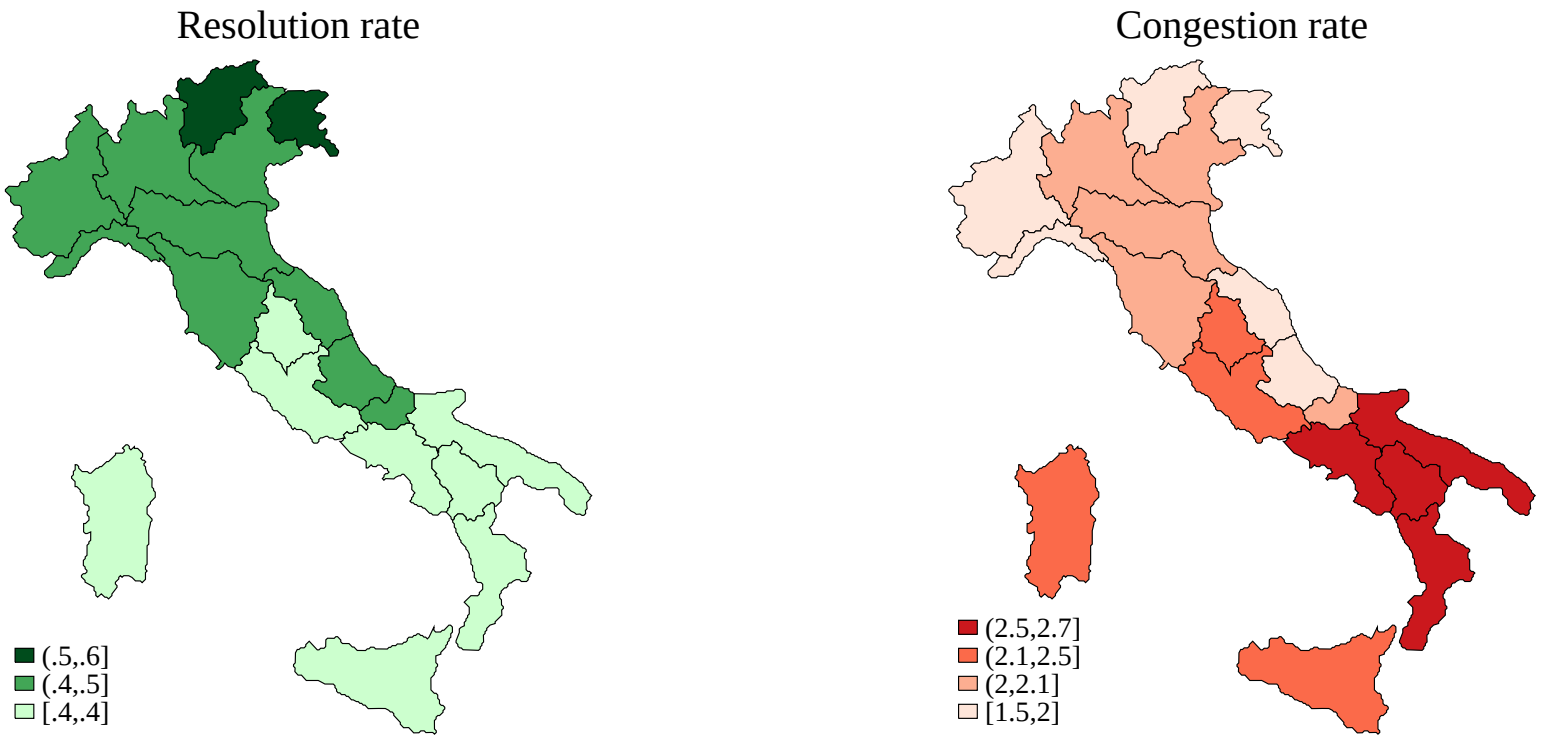
Notes: This Table shows the five-year averages of the judge turnover rates, congestion and resolution rates at the district level. The macro-region "South" includes also the Islands. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where "statutory number of judges" is the total number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the total statutory number of judges. The variable *Vacancy rate* is computed as the difference between the separation and the accession rates. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases, where the caseload is computed as the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Figure 1: *Measures for Judges' Turnover (Five-Year Average at Regional Level, 2008-2012)*



Notes: This figure shows the five-year averaged measures for judge turnover at regional level. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where the statutory number of judges is the number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the statutory number of judges. The variable *Vacancy rate* is computed as the difference between the separation and the accession rates. Class breaks correspond to quantiles of the distribution of the variable used as a measure of judge turnover, thus each class includes approximately the same number of polygons.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Figure 2: *Measures for Judicial Performance (Five-Year Average at Regional Level, 2008-2012)*



Notes: This figure shows the five-year averaged measures for judicial performance at regional level. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases. The caseload is the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload. Class breaks correspond to quantiles of the distribution of the variable used as a measure of judicial performance, thus each class includes approximately the same number of polygons.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

4.2 Econometric Specification and Results

We now illustrate the econometric specification used to test and measure the effect of judge turnover on judicial performance. We consider whether and how much judge turnover rates affect the congestion rate and the resolution rate (for both civil and criminal cases in aggregate) in each Court of Appeal District.[22]

It is worth remarking that the significant correlation between judge turnover congestion rate found in the previous section may indicate two possible relations: (1) high judge turnover negatively affects judicial performance, or (2) low judicial performance positively affects judge turnover since judges might want to leave poorly performing courts. In other words, the correlation could run in both directions. The descriptive evidence in the previous section suggests the direction of this correlation: changes in turnover predict subsequent changes in judicial performance. The direction of the causal link might be conjectured on the basis of the findings from previous research and field experiments. As mentioned in the introduction, Coviello et al. (2014a,b) reported a causal link between the scheduling method of judges, their individual performance, and ultimately the performance of courts in terms of trial durations. In these studies, many judges adopt a parallel case-scheduling method, and manage many cases simultaneously. This practice has a negative effect on court performance: when judges are transferred their cases are rescheduled for adjournment and are left on queue. [23] Even though descriptive data and previous research might suggest the direction of the causal relationship between judge turnover and judicial performance, our paper basically uses a correlational design, so we cannot assign causality and say that increased turnover causes lower performance gain. We can only conclude that our results are consistent with such a causal relationship.[24]

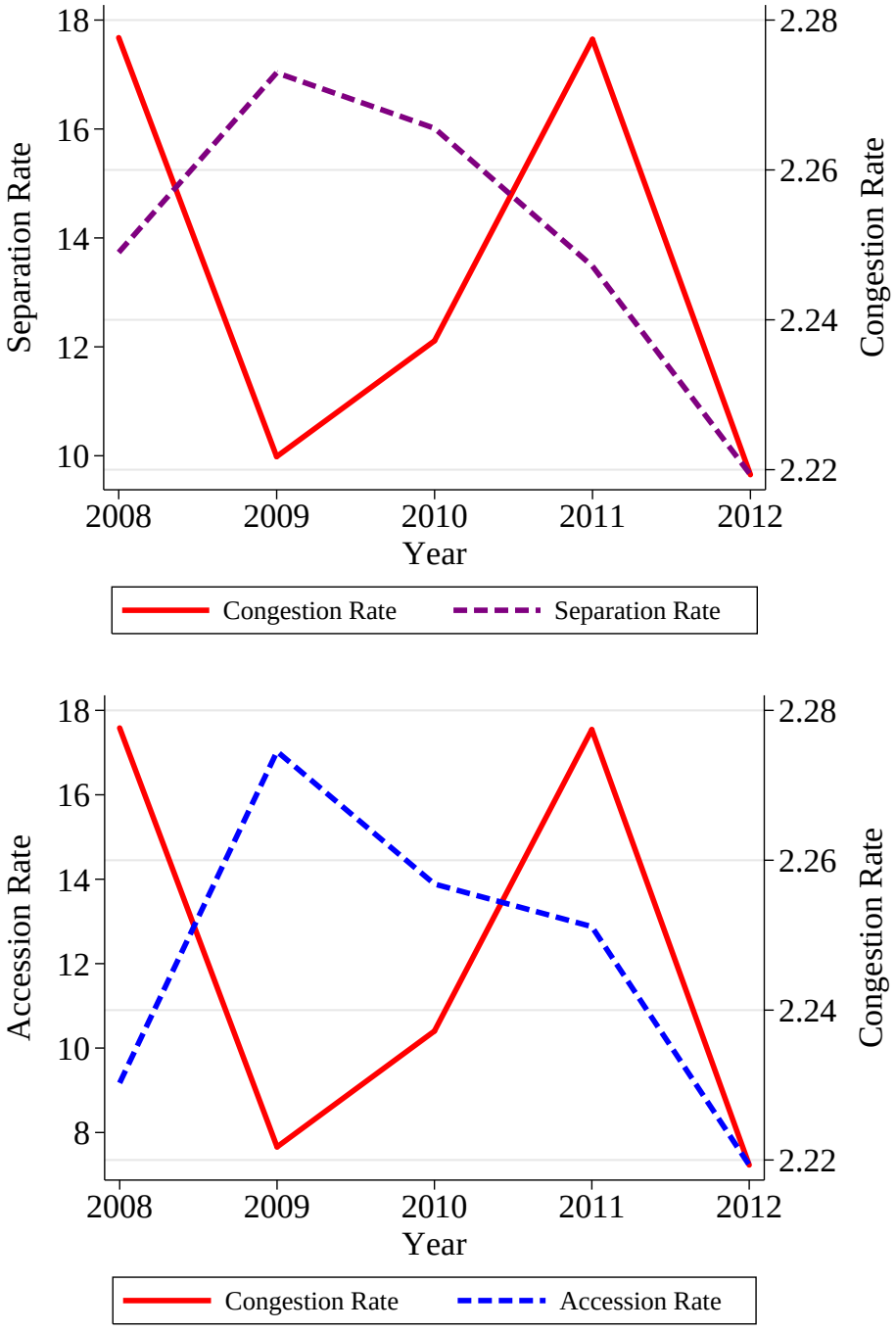
The best our data allow to do about testing the impact of judge turnover on judicial per-

[22]The available data do not allow to perfectly distinguish between civil and criminal cases. In other words, we are not able to observe which judge is working on which type of case (civil or criminal case). For this reason, we have to consider both civil and criminal cases altogether. Obviously, this aggregation of data influences the interpretation of our results: the effect that we estimated is an average effect, and, therefore, may underestimate the congestion rate for some type of cases, and overestimate it for some other types (plausibly, overestimates occur for criminal cases since on average the judicial system perform better in criminal matters rather than civil; CEPEJ, 2012). Data at the judge-level would have led to more accurate estimates. For an example of analyses at the individual level of judges, see Coviello et al. (2009, 2014a).

[23]As mentioned before, the studies by Coviello et al. (2014a,b) performed statistical testing at the individual level. One key-finding is that judges differ a lot in terms of active cases simultaneously open on their desks, whereas their caseload is by definition uniformly distributed for Constitutional reasons (cases are assigned to cases randomly). A field experiment in the Court of Appeal of Rome confirmed the findings. See: `http://archivio.lavoce.info/articoli/pagina1003093.html` (in Italian; last access: 19 July 2014).

[24]As already acknowledged, the data available did not allow us to observe differences in skills and motivation among judges, and to differentiate neither among different types of turnover, such as voluntary and involuntary, horizontal or vertical turnover, nor among case types that may vary across judges within a district. Differences across districts are empirically controlled with fixed effects in our model. Current data does not allow to control for other within-district differences. The results from our analysis should be thus interpreted in the light of such limitations, and knowing that different types of turnover and of judicial cases might differentially affect performance improvement.

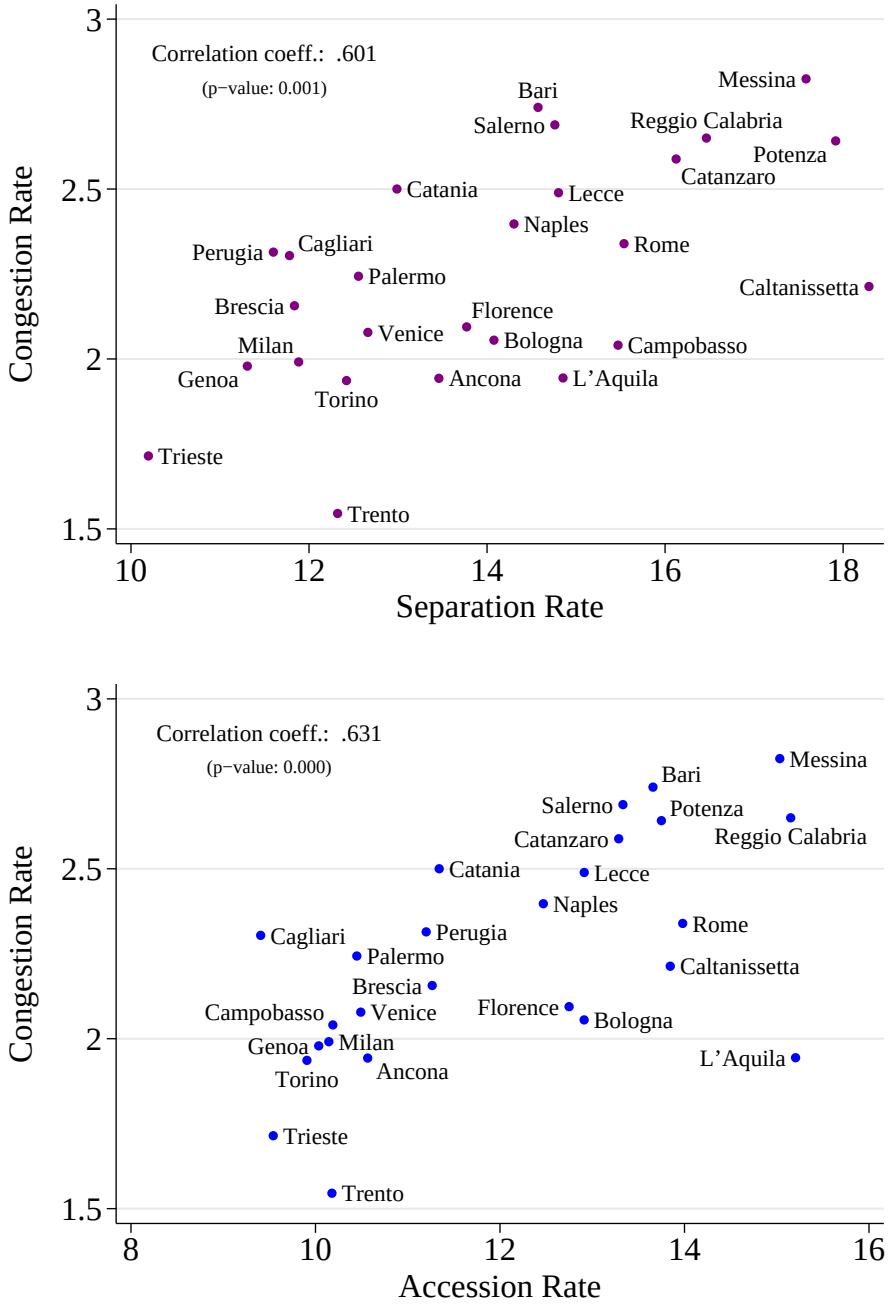
Figure 3: *Judges' Turnover and Congestion Rate, by Year (Average at District Level)*



Notes: This figure shows the time-series of judge turnover and congestion rate in the average Court of Appeal District during 2008-2012. The measures for judge turnover and the congestion rate are computed as yearly averages at the district level. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases. The caseload is the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where the statutory number of judges is the number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the statutory number of judges.

Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Figure 4: *Judges' Turnover and Congestion Rate, by Court of Appeal District (Five-Year Average, 2008-2012)*



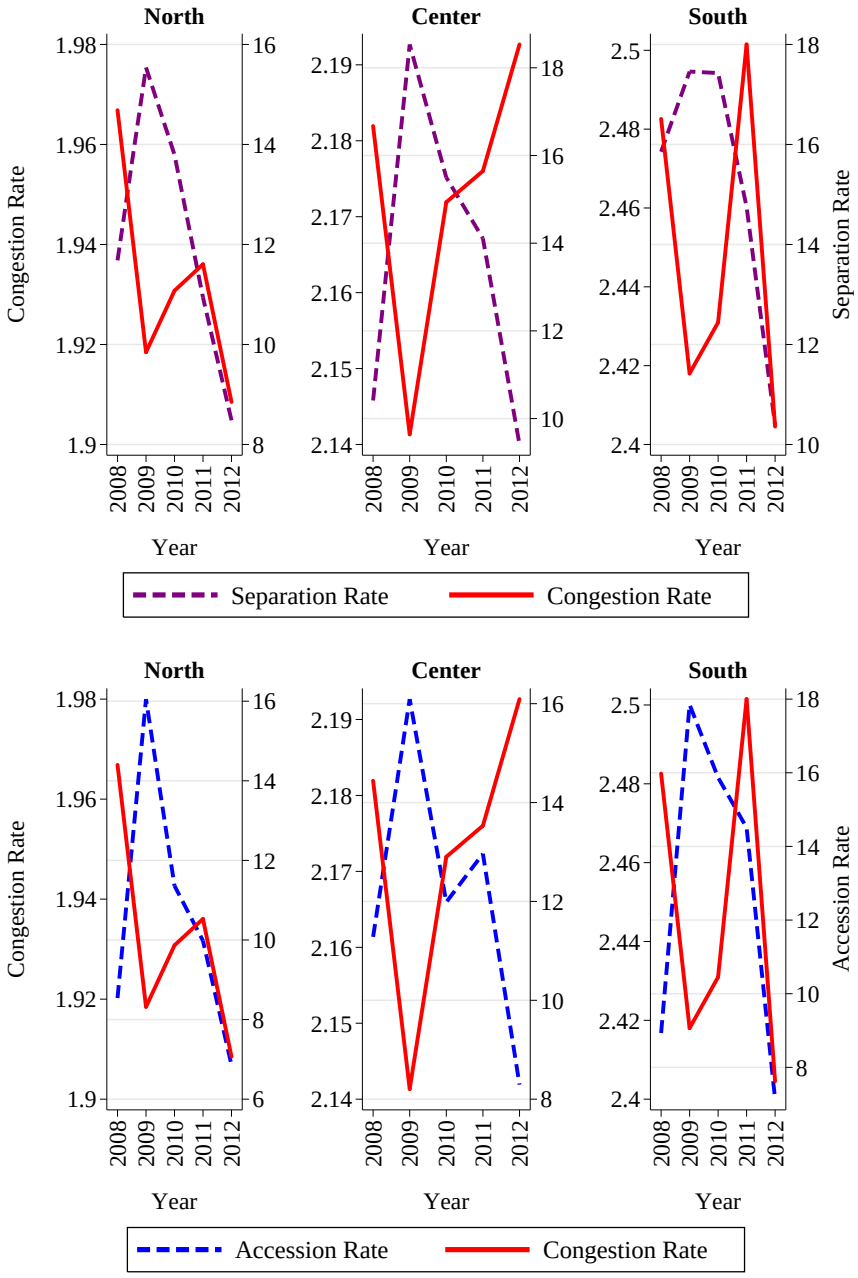
Notes: This figure shows the correlation between the judge turnover rates and the congestion rate in the 26 Court of Appeal Districts. The measures for judge turnover and the congestion rate are computed as five-year averages over the period 2008-2012 at the district level. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases. The caseload is the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where the statutory number of judges is the number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the statutory number of judges.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Table 7: *Judges' Turnover and Judicial Performance, by Year and Macro-Regions (Average at District Level)*

Year	Macro-Reg.	Judges' Turnover			Judicial Performance	
		Separation	Accession	Vacancy	Congestion	Resolution
2008	North	11.68	8.54	3.14	1.97	0.51
	Center	10.41	11.28	-0.87	2.18	0.46
	South	15.85	8.93	6.92	2.48	0.41
2009	North	15.54	16.05	-0.51	1.92	0.53
	Center	18.53	16.09	2.44	2.14	0.47
	South	17.46	17.85	-0.39	2.42	0.42
2010	North	13.79	11.36	2.43	1.93	0.52
	Center	15.50	11.99	3.51	2.17	0.46
	South	17.43	15.87	1.56	2.43	0.42
2011	North	10.94	9.98	0.96	1.94	0.52
	Center	14.11	12.96	1.15	2.18	0.46
	South	14.75	14.51	0.25	2.50	0.41
2012	North	8.48	6.86	1.62	1.91	0.53
	Center	9.41	8.29	1.11	2.19	0.46
	South	10.39	7.14	3.25	2.40	0.42
Average	North	12.09	10.56	1.53	1.93	0.52
	Center	13.59	12.12	1.47	2.17	0.46
	South	15.18	12.86	2.32	2.45	0.41

Notes: This Table shows the yearly averaged judge turnover rates, congestion and resolution rates at the district level. The abbreviation "Macro-reg." stands for "Macro-regions". The macro-region "South" includes also the Islands. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where "statutory number of judges" is the total number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the total statutory number of judges. The variable *Vacancy rate* is computed as the difference between the separation and the accession rates. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases, where the caseload is computed as the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload. The *Average* is computed as the five-year average of the variables at the district level.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Figure 5: *Judges' Turnover and Congestion Rate, by Year and Macro-Region (Average at District Level)*



Notes: This figure shows the time-series of judge turnover and congestion rate in the average Court of Appeal District of the North, Center and South of Italy during 2008-2012. The measures for judge turnover and the congestion rate are computed as yearly averages at the district level. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases. The caseload is the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where the statutory number of judges is the number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the statutory number of judges. The macro-region "South" includes also the Islands.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

formance is to exploit variations over time of both response variables and regressors instead of using levels: do changes in judge turnover affect subsequent changes in judicial performance? To exploit timing and to avoid serial correlation of errors, we based the econometric analysis on a normative first-difference regression model with distributed lags and year fixed effects, specified as follows:

$$\Delta p_{i,t} = \Delta j_{i,t}\,\alpha_1 + \Delta j_{i,t-1}\,\alpha_2 + \Delta v_{i,t}\,\alpha_3 + \Delta v_{i,t-1}\,\alpha_4 + X\,\alpha_5 + \Delta u_{i,t}, \qquad t = 2,\ldots,T \qquad (4.1)$$

where p is a measure for judicial performance (i.e., congestion rate or resolution rate), j is a measure for judge turnover (i.e., separation rate, accession rate or flux rate), v is the vacancy rate, and X is the set of variables to control for year fixed effects. First differences are denoted by $\Delta p_{i,t} = p_{i,t} - p_{i,t-1}$, $\Delta j_{i,t} = j_{i,t} - j_{i,t-1}$, $\Delta j_{i,t-1} = j_{i,t-1} - j_{i,t-2}$, $\Delta v_{i,t} = v_{i,t} - v_{i,t-1}$, and $\Delta v_{i,t-1} = v_{i,t-1} - v_{i,t-2}$. All the specifications employ cluster-robust standard errors at the district level.

We conjecture that increases in judge turnover lead to statistically significant increases in congestion rate (or, equivalently, decreases in resolution rate). If the conjecture is verified, we ask how much judicial performance changes as a result of a marginal increase in judge turnover rates.

Tables 8 and 9 show the estimation results. We begin by considering the impact of vacancy and accession rates on the judicial performance. This allows us to detect the two reasons why judge turnover can delay the resolution of cases: first, the asynchrony between outbound and inbound judge and the consequent suspension of the outbound judge's pending cases until the arrival of an inbound colleague, and second, the replacement of the original judge with the "new" one that inherits the pending cases and inevitably treat them as newly filed cases.

Column (1) in Tables 8 and 9 show the main result of our analysis. A marginal increase in the percentage of vacant positions in a specific year leads to a statistically significant increase in the congestion rate of 0.5% in the subsequent year (a statistically significant decrease in the resolution rate of 0.09%). This signals a delay in the resolution of cases due to the asynchrony between outbound and inbound judges and the suspension of some active cases awaiting to be resolved. Moreover, a marginal increase in the accession rate in a specific year leads to an increase in the congestion rate of 0.9% in that year and of 0.6% in the subsequent year. Coherently, we observe a decrease in the resolution rate of 0.13% in that year and of 0.1% in the subsequent year. By considering the standard deviation of the independant variable, an increase of 5% in the accession rate in a specific year leads to an increase in the congestion rate of 4.5% in that year and of 3% in the subsequent year (and to a decrease in the resolution rate of 0.65% in that year and of 0.5% in the subsequent year). This result shows the negative effect of the change of the original judge: the inbound judges inherit the pending cases from the outbound judges and have also to deal with the newly filed cases. This causes a delay in the disposition of pending cases as well as of new cases. We expect this impact to be greater the

greater is the pending cases an inbound judge inherits from the outbound colleague.

We also tested the impact of the overall turnover rate (measured with the flux rate) on the judicial performance. Column (4) in Tables 8 and 9 show the result: a marginal increase in the overall rate of judge turnover in a specific year leads to an increase in the congestion rate of .46% in that year and of 0.5% in the subsequent year. Similar results are obtained considering the resolution rate. By considering the standard deviation of the independant variable, an increase of 8% in the overall rate of judge turnover in a specific year leads to an increase in the congestion rate of 3.68% in that year and of 4% in the subsequent year. This finding shows the negative impact over time of the aggregate percentage of inbound and outbound judges on judicial performance.

[Tables 8 and 9 about here.]

5 Discussion and Conclusions

In this section, we discuss the results and some policy prescriptions to mitigate the detrimental effects of judge turnover on judicial performance. We discuss the external validity of our findings for other countries, and we present the case of Texas as a comparative example. We conclude with some recommendations on future research directions.

The results from the empirical analysis show that judge turnover is a widespread phenomenon in Italy which negatively affects judicial performance. The effect of a 1% increase in judge turnover on the congestion and resolution rates – although statistically significant – may appear negligible in its magnitude. However, considering that, on average, every year in each Court of Appeal District around 14% of judges leave their current position and a 2% of positions remain vacant awaiting inbound judges, on average, the delay placed on the disposition of cases is remarkable. In this paper, we estimated that this negative effect is statistically significant at the level of Court of Appeal District. Building on our results, below we offer policy prescriptions that may substantially mitigate the impact of judge turnover on judicial performance. We discuss four main points: (*a*) the enforcement of transfer synchrony, (*b*) the design of clearer methods to manage the outbound judge's pending caseload, (*c*) the adoption of sequential task-scheduling practices by judges, (*d*) the need for data analytics on judicial data.

Enforcement of transfer synchrony. The descriptive evidence illustrated in Section 4.1 showed the existence of asynchrony between inbound and outbound transfers, and that this lack of coordination generates a vacancy rate of 2%. Considering the caseload of each judge, this delay has practical consequences: cases suffer of a chain of delays impacting ultimately on their disposition time and on courts' congestion. A single transfer alone may be manageable even in absence of timely coordination between outbound and inbound transfers. This lack of synchrony does not allow, for example, a handover period between the outbound and inbound judges. The problem is that each court office is involved in managing more than one transfer throughout the year.

Clearer methods and policies. This policy prescription comes from the analysis of the current regulation, and calls the attention of legislators. Minor flaws in the process of managing outbound judges' case backlogs would go almost unnoticed if judge turnover were low. Our data show that, on average, in the period 2008-2012 in each Court of Appeal District, there are 12.03% inbound judges and 13.98% outbound judges, for a total turnover of 26%. In this case, the lack of both a coordination of outbound and inbound transfers produces a chain of delays that negatively affects judicial performance. Here we have two issues to discuss. The first is concerned with the legal provision that requires judges to stay in the same office for a minimum of three and a maximum of ten years in order to guarantee their independence. With a yearly judge turnover rate of 26%, one may wonder how many judges are in charge in the same office for ten years consecutively. If a marginal reduction in judge turnover rates has a positive

Table 8: *The Effect of Judges' Turnover on Judicial Performance (Congestion Rate)*

	(1)	(2)	(3)	(4)
Dependent variable		Δ congestion rate$_{i,t}$		
Δ accession$_{i,t}$	.921***	.758***	.801***	
	(.249)	(.197)	(.187)	
Δ accession$_{i,t-1}$	.693***	.208		
	(.164)	(.159)		
Δ vacancies$_{i,t}$	.163			-.297
	(.242)			(.182)
Δ vacancies$_{i,t-1}$	.485**		-.219	-.139
	(.178)		(.162)	(.147)
Δ separation$_{i,t}$		.163		
		(.242)		
Δ separation$_{i,t-1}$		.485**	.655***	
		(.178)	(.154)	
Δ flux$_{i,t}$				.460***
				(.124)
Δ flux$_{i,t-1}$				.346***
				(0.082)
Year FE	X	X	X	X
Observations	78	78	78	78
R^2	.429	.429	.425	.429

Notes: This Table shows the estimates of the first-difference regression model with distributed lags and year fixed effects. Cluster standard errors at the district level are in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the congestion rate. The regressors are the accession, the separation, the vacancy and the flux rates. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases. The caseload is the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where the statutory number of judges is the number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the statutory number of judges. The variable *Vacancy rate* is computed as the difference between the separation and the accession rates. The variable *Flux rate* is computed as the percentage of inbound and outbound judges over the total statutory number of judges. First differences are denoted as follows: $\Delta congestion_{i,t} = congestion_{i,t} - congestion_{i,t-1}$; $\Delta j_{i,t} = j_{i,t} - j_{i,t-1}$, $\Delta j_{i,t-1} = j_{i,t-1} - j_{i,t-2}$; where j denotes accession rate, separation rate, flux rate; $\Delta vacancies_{i,t} = vacancies_{i,t} - vacancies_{i,t-1}$, and $\Delta vacancies_{i,t-1} = vacancies_{i,t-1} - vacancies_{i,t-2}$.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Table 9: *The Effect of Judges' Turnover on Judicial Performance (Resolution Rate)*

	(1)	(2)	(3)	(4)
Dependent variable		Δ resolution rate$_{i,t}$		
Δ accession$_{i,t}$	-.127***	-.101***	-.108***	
	(.037)	(.036)	(.031)	
Δ accession$_{i,t-1}$	-.108***	-.018		
	(.028)	(.23)		
Δ vacancies$_{i,t}$	-.026			.038
	(.0.40)			(.033)
Δ vacancies$_{i,t-1}$	-.090***		.020	-.036
	(.030)		(.023)	(.023)
Δ separation$_{i,t}$		-.026		
		(.040)		
Δ separation$_{i,t-1}$		-.090***	-.102***	
		(.030)	(.026)	
Δ flux$_{i,t}$				-.064***
				(.019)
Δ flux$_{i,t-1}$				-.054***
				(.014)
Year FE	X	X	X	X
Observations	78	78	78	78
R^2	.403	.403	.399	.403

Notes: This Table shows the estimates of the first-difference regression model with distributed lags and year fixed effects. Cluster standard errors at the district level are in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the resolution rate. The regressors are the accession, the separation, the vacancy and the flux rates. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload. The caseload is the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where the statutory number of judges is the number of judges as prescribed by statutory provisions. The variable *Accession rate* is computed as the percentage of inbound judges over the statutory number of judges. The variable *Vacancy rate* is computed as the difference between the separation and the accession rates. The variable *Flux rate* is computed as the percentage of inbound and outbound judges over the total statutory number of judges. First differences are denoted as follows: $\Delta resolution_{i,t} = resolution_{i,t} - resolution_{i,t-1}$; $\Delta j_{i,t} = j_{i,t} - j_{i,t-1}$, $\Delta j_{i,t-1} = j_{i,t-1} - j_{i,t-2}$; where j denotes accession rate, separation rate, flux rate; $\Delta vacancies_{i,t} = vacancies_{i,t} - vacancies_{i,t-1}$, and $\Delta vacancies_{i,t-1} = vacancies_{i,t-1} - vacancies_{i,t-2}$.
Source: Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

impact on judicial performance, raising the minimum duration from three to six years and the maximum from ten to twelve would probably have positive effects.[25] The second is that the current law does not take into account the pending caseload of a judge in consideration of her transfer. A solution for this problem is to "unlock" the voluntary transfer once a certain amount of backlog is resolved (for instance, to "unlock" the transfer *today* the judge must have resolved the cases of the *three past years* – or earlier). Both solutions allow the outbound judge to exploit for longer the experience acquired on her caseload. Having received notice of her transfer, the judge may ask to work on the pending cases for the majority of his time and to request a partial exemption for the "new" cases, which can be reassigned to other colleagues. This will raise the chances of disposing of all the cases filed in the previous years, which are well known by the judge and already scheduled. The rules on *mandatory* transfer cover the exceptions to the proposed rule on *voluntary* transfers.

Sequential case-scheduling practices. Practical knowledge of Italian courts and the data analysis in our research suggest that when judges can correctly manage their caseload, the negative impact of turnover can be reduced dramatically. Given that the decision to transfer a judge is taken by the High Council for the Judiciary, regardless of caseload, outbound judges – taken individually – may fall short in considering the potential effects of their transfer on the judicial performance. Inbound judges have no other choice than rescheduling the backlog according to their working habits, and the adjournment of all the cases once they take service. This last contingency placed our focus on the calendar of the individual judge. A measure already suggested by Coviello et al. (2009) is to allow a judge to move only when he has a small number of pending cases. This solution would be more easily implemented if judges avoided excessive multitasking (i.e., working on multiple cases simultaneously). Coviello et al. (2014a,b) provided evidence on the desirability of a sequential case-scheduling method in judges' work: for a given number of active cases, a judge who works on his active cases ideally "one-at-a-time" is able to dispose them in less time than a judge who works simultaneously on all her cases. In other words, a sequential case-scheduling method allows the judge to be more focused on the single case (or on a few cases) thereby substantially reducing the average time from filing to disposition. Furthermore, if the outbound judge works sequentially on his active cases, the negative effect of his transfer on the duration of his cases would be substantially reduced since the amount of pending cases passed on to the inbound judge or by his colleagues is lower than if the judge had worked simultaneously on more cases.

Data analytics on judicial data. Our experience as researchers with access to court administration data in Italy shed light on different research problems for data-driven policy analysis in the justice sector. As recently pointed out also by Steelman and Fabri (2008), the lack of

[25]This rule may lead to positive effects even conceding that the rule only applies except in case of serious illness, service, or family reasons. Clearly, the effectiveness of the rule may depend on the proportion of turnover cases based in these exceptions.

modern data infrastructures and the strong preference for "paper" do not allow court executives – in particular the president of the court – to grasp the full picture and have control on the consequences of transfers on court delays. In Italy, a decade-long digitalization of civil justice is leading to a transformation of how courts work. In criminal justice, the digitalization has been slower, and today most courts still use technology of the late 1980s, although modern IT systems will be implemented in the next few years. Other solutions have been recently proposed using the study of judges' working habits based on Big Data analysis and Artificial Intelligence applied to caseflow management.[26]

Obviously, the negative effects of judge turnover could be completely negated by preventing the transfer of judges. A complete immobility is, however, contrary to constitutional principles on judicial independence and impartiality. Probably, a semi-liberalization of transfers would also lead to undesirable outcomes given the existence of heterogeneities across Districts and regions. We believe that the proposals contained in this section are implementable with the current state of the law and with the voluntary participation of judges, court executives, and public administration in the design and the scientific experimentation on alternative policies and virtuous practices. Any collaboration between researchers, judges, and public administration geared towards research out puts in the field of judicial efficiency will mark a fundamental step toward improvements of the current situation in Italy.

The results of this research are in line with the contributions on human resource stability and performance, suggesting a negative association between voluntary employee turnover and organization performance (Glebbeek and Bax, 2004; Meier and Hicklin, 2008; Ton and Huckman, 2008; Subramony and Holtom, 2012; Park and Shaw, 2013; Hancock et al., 2013). While previous studies have focused on several professional settings in the private sector and public education, our study is the first to investigate the existence of this relationship in the justice system. Hancock et al. (2013) extensively reviewed potential moderators of the turnover-performance relationship, implicitly suggesting some solutions to the corresponding dysfunctional effects. More specifically, the relationship is more negative (a) in industries characterized by higher as opposed to lower knowledge and skill requirements; (b) in regions where labor costs are higher, such as the United States and Europe; (c) in more individualistic contexts and cultures (such as the United States, the United Kingdom and the Netherlands, because work processes depend more on unique human and social capital resources associated with specific individuals);[27] (d) in a liberal market economy (such as the United States and the United Kingdom); and (e) in

[26]One of these initiatives is *A>Lex*, a software prototype (free to the public administration) for the automatic scheduling of court hearings. The software implements optimal-scheduling algorithms, and is currently under experimental testing by a team of judges in three large Italian courts. See also McWilliams (1992), Taggart, Mays, and Hamilton (1985) and Pekkanen, Eronen, Pirttilä, and Jalonen (2015) on caseflow management solutions.

[27]In more collective cultures such as China, Japan and Korea, where employees are expected to function in complementary ways within the group, it may be simpler to find and integrate replacements into group functioning (Hancock et al., 2013).

smaller and medium as opposed to larger organizations. Further research on the moderators of the judge turnover-judicial performance relationship would be interesting to define more specific and general policy implications.

More in general, we may ask whether other countries experience similar turnover effects in Judicial Courts. The question takes acute significance, and surprisingly there are no research contributions addressing this topic. Thus, a comparative analysis with other countries appears to be a difficult task, because the study of judge turnover has been neglected so far and data on judge turnover are almost absent or difficult to obtain.

More generally, we may ask whether other countries experience similar turnover effects in judicial courts. The question occupies acute significance and surprisingly there are no research contributions addressing this topic. Thus, a comparative analysis with other countries appears to be a difficult task given that the study of judge turnover has been neglected thus far and data on judge turnover are largely absent or difficult to obtain. Despite the difficulties in conducting a comparative analysis, we have succeeded in collecting some data of the Judicial Courts in Texas. There are two reasons why we searched for Texas: data are publicly available, while Texas is a common-law country and one of the largest US states. The judicial system in Texas is radically different from the judicial system in Italy: Italy is a civil-law country, whereas Texas is a common law country. Structurally, the two legal systems operate in very different ways: civil law relies on professional judges, legal codes and written records, while common law relies on lay judges, broader legal principles and oral arguments. Accordingly, the court organization system also differs, although both of the systems implement provisions to manage judicial turnover. Here, we provide some data from Texas suggesting that the results presented in this paper may hold for other countries, independently of the legal system and court organization. The Texas Office of Court Administration offers judicial data concerning the activity of courts and judge turnover rates.[28] This highlights a first cultural difference with the Italian system, where information concerning the career of judges is not publicly available. To elaborate the comparison between the two countries, we use data from the Italian National Institute of Statistics and the US Census Bureau for population, the statistics available on the Office of Court Administration website and our data (from the Higher Council for the Judiciary and the Ministry of Justice) on court activity and judge turnover. For the sake of comparability with the Italian data, we considered only outbound judges and we excluded supreme court judges. We used the ratio between outbound judges and the number of judges in service as an indicator of judge turnover for every year (2008-2012). To compute the caseload in Texas, we considered only appellate and district court cases, thus excluding supreme courts' and statutory country courts' cases. We computed the congestion and resolution rates for Texas with the same formula used for Italy.

[28] See Texas Office of Court Administration, Report on Judicial Salaries and Turnover for Fiscal Years 2008-2009, 2010-2011 and 2012-2013, available online at: http://www.txcourts.gov/judicial-data.aspx (last access: 4 June, 2016).

Table 10 shows that judge turnover rates do not significantly differ between Italy and Texas. It also shows that the caseload per judge is considerably higher in Texas compared with Italy, while there are also fewer judges per 100k inhabitants in Texas. While these observations may be related to differences in legal system, legal procedures, litigation rates and cultural factors, court performance indicators do not substantially differ between the two countries, although courts in Texas seem to outperform those in Italy. Despite the few data points, Table 11 also suggests that performance is lower in the Texas judicial system, where judge turnover is higher. This may indicate that our hypothesis could also be applicable to other judicial settings, regardless of the legal system or how the court organization system manages judges' turnover. However, we are aware that this claim warrants further empirical investigation in the future.

[Tables 10 and 11 about here.]

Table 10: *Judges and Activity in State and Appellate Courts: Texas vs. Italy*

	2008		2009		2010		2011		2012	
	Texas	Italy	Texas	Italy	Texas	Italy	Texas	Italy	Texas	Italy
Population (thous.)	24,310	57,690	24,800	59,100	25,260	59,280	25,660	59,380	26,090	59,540
Actual no. of judges	549	8,468	549	8,904	554	8,561	554	8,296	555	7,769
Judges x 100.000 inhab.	2.26	14.68	2.21	15.07	2.19	14.44	2.16	13.97	2.13	13.05
Outbound judges	77	1,054	77	1,497	73	1,325	73	1,154	69	771
Separation rate	0.140	0.124	0.140	0.168	0.132	0.155	0.132	0.139	0.124	0.099
Newly filed cases	882,163	6,018,746	881,846	6,187,860	900,742	6,164,090	912,158	5,946,512	856,209	5,978,155
Resolved cases	857611	5850790	871596	6058182	867523	6063450	883366	5908393	942663	5974153
Resolved x 1 judge	1562.13	690.93	1587.61	680.39	1565.93	708.26	1594.52	712.20	1698.49	768.97
Congestion rate	2.09	2.27	2.05	2.22	2.09	2.23	2.10	2.27	1.81	2.21
Resolution rate	0.48	0.45	0.49	0.46	0.48	0.46	0.48	0.45	0.55	0.46

Notes: The variable *Separation rate* is computed as the percentage of outbound judges over the statutory number of judges where "statutory number of judges" is the total number of judges as prescribed by statutory provisions. The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases, where the caseload is computed as the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload.
Source: Data from the Italian National Institute of Statistics and the US Census Bureau for population. Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

Table 11: *Judge Turnover and Court Performance: Texas vs. Italy*

	Texas			Italy		
Year	Outbound	Congestion	Resolution	Outbound	Congestion	Resolution
2008	0.140	2.09	0.48	0.124	2.27	0.45
2009	0.140	2.05	0.49	0.168	2.22	0.46
2010	0.132	2.09	0.48	0.155	2.23	0.46
2011	0.132	2.10	0.48	0.139	2.27	0.45
2012	0.124	1.81	0.55	0.099	2.21	0.46

Notes: The variable *Congestion rate* is measured by the entire caseload divided by the number of resolved cases, where the caseload is computed as the sum of pending cases at the beginning of the year and the newly filed cases from the current year. The variable *Resolution rate* is defined as the number of resolved cases divided by the entire caseload.
Source: Data from the Italian National Institute of Statistics and the US Census Bureau for population. Authors' elaboration on official data from the Ministry of Justice (*Ministero della Giustizia*) and the High Council for the Judiciary (*Consiglio Superiore della Magistratura*).

In conclusion, this paper represents the first empirical study on the negative consequences of judge turnover on judicial performance. This phenomenon, to our knowledge, has been so far overlooked by scholarship and legal practitioners. Besides the relevance of the phenomenon to the efficiency of the Italian judicial system and the novelty of the data used to investigate judge turnover, we are aware that this study presents limitations that will require future investigation. The major limitation is in the detail of our data. To investigate the effects of judge turnover, microdata at the individual- or case- level would have allowed a wide array of analyses, including different research designs for the investigation of causality (IV designs and experimental designs). Whether judge turnover affects judicial performance thus remains an open and interesting question for further research which ultimately depends on the availability of relevant data. This paper provides an important initial step for future research on the effects of judicial turnover on judicial performance. The reasons why judges voluntarily leave their offices and judicial cases, and possible solutions to reduce turnover constitute some of the most interesting and important avenues for future research.

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